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09/910,329	07/20/2001	Jung-Lin Pan	I-2-131.1US	3627

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VOLPE AND KOENIG, P.C.  
DEPT. ICC  
UNITED PLAZA, SUITE 1600  
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PHILADELPHIA, PA 19103

EXAMINER

LOGSDON, JOSEPH B

ART UNIT	PAPER NUMBER
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2662

DATE MAILED: 03/18/2004

9

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/910,329

Applicant(s)

PAN ET AL.

Examiner

Joe Logsdon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) \_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6,8 . 6) ☐ Other: .

**Claim Rejections—35 U.S.C. 102(b):**

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4-8, 10, 11, 13-17, 19, 20, 22-26, 28, 30, 32, 33, 35, 37, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Papadopoulos et al.

With regard to claims 1, 10, 19, 28, 30, 33, and 38, Papadopoulos et al. teaches a method and system that reduces mixed co-channel interference (abstract) in a TDMA system. Mixed co-channel interference occurs when a downlink transmission from one base station antenna in a given cell interferes with uplink reception in another base station antenna (abstract). Potentially interfering antennae (and, hence, cells) are determined (abstract; column 9, lines 44-47; column 9, lines 55-58). A potentially interfering antenna in a given cell is directed to transmit downlink information in a different portion of the frame (and, hence, a different time slot) from that in which a potentially interfered with antenna receives uplink information (abstract; column 8, line 48 to column 9, line 23). The system inherently forms an availability list because the system knows which cells are potential interfering cells (column 9, lines 44-58; column 10, line 48 to column 11, line 24).

With regard to claims 2, 4, 5, 8, 11, 13, 14, 17, 20, 22, 23, and 26, Papadopoulos et al. teaches that the interference could be base station to base station interference or user equipment

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to user equipment interference (the interference could be either “regular CCI” or “mixed CCI”; column 8, lines 31-43).

With regard to claims 6, 7, 15, 16, 24, and 25, Papadopoulos et al. teaches that the user equipment to user equipment interfering cells are geographically nearby, which could be adjacent (column 9, lines 44-58).

With regard to claims 32, 35, and 37, Papadopoulos et al. teaches determining user equipment to user equipment as well as base station to base station cross interfering cells, estimating the interference as unacceptable, if any of the interfering cells uses that timeslot for the uplink or downlink for UE-UE interfering cells or BS-BS interfering cells, respectively (column 8, lines 30-43; column 9, lines 44-58; column 10, line 48 to column 11, line 24).

### **Claim Rejections—35 U.S.C. 103(a):**

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Papadopoulos et al.

With regard to claim 39, Papadopoulos et al. fails to teach a memory for storing an availability list. The system of Papadopoulos et al. inherently forms an availability list because the system knows which cells are potential interfering cells (column 9, lines 44-58; column 10, line 48 to column 11, line 24). It would have been obvious to one of ordinary skill in the art to modify the teaching of Papadopoulos et al. so that it teaches a memory for storing an availability list because such an arrangement would enable the memory to be periodically changed as conditions warrant.

With regard to claim 40, Papadopoulos et al. fails to teach a timeslot controller for updating at least a portion of the availability list and a memory for storing the at least a portion. It would have been obvious to one of ordinary skill in the art to modify the invention of Papadopoulos et al. so that it teaches a timeslot controller for updating at least a portion of the availability list and a memory for storing the at least a portion because such an arrangement

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would enable the system to maintain updated data concerning interfering cells even when the mobile stations move from one cells to another.

With regard to claim 41, Papadopoulos et al. fails to teach that the at least a portion is the entire availability list. It would have been obvious to one of ordinary skill in the art to modify the invention of Papadopoulos et al. so that it teaches that the at least a portion is the entire availability list because such an arrangement would enable the system to maintain updated data concerning interfering cells even when the mobile stations move from one cells to another.

With regard to claim 42, Papadopoulos et al. fails to teach that the at least a portion is only information from the availability list pertaining to the particular cell. It would have been obvious to one of ordinary skill in the art to modify the invention of Papadopoulos et al. so that it teaches that the at least a portion is only information from the availability list pertaining to the particular cell because such an arrangement would reduce the amount of memory required for the availability list.

7. Claims 3, 12, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Papadopoulos et al. in view of Leung.

With regard to claim 3, 12, and 21, Papadopoulos et al. fails to teach that link gains are used to determine which cells are base station to base station interfering cells. Leung teaches the use of link gains to minimize co-channel interference among neighboring cells (abstract; introduction). It would have been obvious to one of ordinary skill in the art to modify the teaching of Papadopoulos et al. so that link gains are used to determine which cells are base station to

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base station interfering cells, as suggested by Leung, because such an arrangement would enable the system to make use of link gains to measure interference.

8. Claims 9 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Papadopoulos et al. in view of Tomabechi.

With regard to claims 9 and 27, Papadopoulos et al. fails to teach that the system is a time division duplex system. Tomabechi teaches a TDD system (abstract). It would have been obvious to one of ordinary skill in the art to modify the teaching of Papadopoulos et al. so that the system is a time division duplex system, as in Tomabechi, because such an arrangement would enable both uplink and downlink transmissions using the same frequency or CDMA code.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Papadopoulos et al. in view of Miya et al.

With regard to claim 18, Papadopoulos et al. fails to teach a TDD/CDMA system. Miya et al. teaches a TDD/CDMA system (abstract). It would have been obvious to one of ordinary skill in the art to modify the invention of Papadopoulos et al. so that it teaches a TDD/CDMA system because such an arrangement would enable the system to benefit from the advantages of TDD/CDMA such as the ability to reuse the available bandwidth and enhanced security.

10. Claims 29, 31, 34, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Papadopoulos et al. in view of Meche et al.

With regard to claims 29 and 34, Papadopoulos et al. fails to teach that in each timeslot an interference level is measured and that the result is compared to a threshold to estimate unacceptable interference. Meche et al. teaches comparison of measured interference with a threshold (abstract). It would have been obvious to one of ordinary skill in the art to modify the teaching of Papadopoulos et al. so that it teaches that in each timeslot an interference level is measured and that the result is compared to a threshold to estimate unacceptable interference, as in Meche et al., because such an arrangement provides a logical way to distinguish between cells that should be considered interfering cells and cells that should not be considered interfering cells.

With regard to claim 31, Papadopoulos et al. fails to teach that estimation of potentially interfering cells comprises measuring an interference level in each timeslot by each user equipment and comparing the measured levels to a threshold. Meche et al. teaches comparison of measured interference with a threshold (abstract). It would have been obvious to one of ordinary skill in the art to modify Papadopoulos et al. to teach that estimation of potentially interfering cells comprises measuring an interference level in each timeslot by each user equipment and comparing the measured levels to a threshold, as suggested by Meche et al., because such an arrangement would enable the system to use a simple criterion to decide whether two users or base stations potentially interfere.

With regard to claim 36, Papadopoulos et al. fails to teach the measurement of interference in each time slot by each user equipment and the comparison of the measured levels to a threshold to determine whether interference is unacceptable. Meche et al. teaches comparison of measured interference with a threshold (abstract). It would have been obvious to



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one of ordinary skill in the art to modify the teaching of Papadopoulos et al. so that it teaches the measurement of interference in each time slot by each user equipment and the comparison of the measured levels to a threshold to determine whether interference is unacceptable, as in Meche et al., because such an arrangement would provide an obvious way to distinguish between interfering user equipment and user equipment that does not interfere.

### **Conclusion**

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sierens et al., Rozanski et al., Drakopoulos et al., Pan, Kou, Mujtaba, Lopes et al., Yamada et al., and Marinier are cited to show the state of the art.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joe Logsdon whose telephone number is (703) 305-2419. The examiner can normally be reached on Monday through Friday from 10:00 am to 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou, can be reached on 703-305-4744. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joe Logsdon

Patent Examiner

Friday, March 12, 2004



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